^{153}Er α decay (37.1 s) 1996Pa01,1982Bo04,1982De11

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen	NDS 185, 2 (2022)	23-Aug-2022

Parent: ^{153}Er: E=0.0; J^π=(7/2$^-$); $T_{1/2}$=37.1 s *2*; Q(α)=4802.4 *14*; %α decay=53 *3*

^{153}Er-J^π,$T_{1/2}$: From ^{153}Er Adopted Levels in the ENSDF database (August 2020 update).

^{153}Er-$T_{1/2}$: Additional information 1.

^{153}Er-Q(α): From 2021Wa16.

^{153}Er-%α decay: 53% *3* from 1977Ha48. Deduced by comparison of Iα of parent and daughter in equilibrium. Other measurement: 38 *+19−7* (1974To07); 95 *+5−20* from 1963Ma18 seems discrepant.

1996Pa01: ^{106}Cd,^{112}Sn(^{58}Ni,X) with E=300 MeV and 329 MeV ^{58}Ni, respectively, from the Daresbury Laboratory Nuclear Structure Facility. Measured Eα.

1982Bo04(also 1973BoXW): spallation of uranium, thorium, gold and tantalum targets with 5 GeV proton from the LBNL Bevatron. Measured Eα, $T_{1/2}$.

1982De11: 245-300 MeV ^{63}Cu ions on silver, cadmium, indium and tin targets. Measured Eα.

1980Da09: spallation of Ho, Tm, Ta, Re and Au targets with 480-MeV proton from the cyclotron at TRIUMF. Measured Eα, $T_{1/2}$.

1963Ma18: ^{142}Nd(^{16}O,5n) E=75-151 MeV ^{16}O beam from the Berkeley heavy-ion accelerator (HILAC). Measured Eα, $T_{1/2}$, branching ratio.

1970To16: ^{156}Dy(^{3}He,6n) E=97.3 MeV and ^{162}Er(^{3}He,α8n) E=101.2 MeV from the Oak Ridge isochronous cyclotron (ORIC). Measured Eα, $T_{1/2}$.

1974To07: ^{147}Sm(^{12}C,6n) E=118 MeV from ORIC. Measured Eα, γ- and x-rays. Deduced branching ratio.

1977Ha48: spallation of Ta targets with 600-MeV proton from the CERN synchro-cyclotron. Measured Eα, $T_{1/2}$, branching ratio.

1978AfZZ: α emitter was produced with 1 GeV proton from the synchro-cyclotron of Leningrad Nuclear Physics Institute (LNPI) at USSR. Measured Eα, $T_{1/2}$.

1979Ho10 (also 1981HoZM): Ag, Pd, Rh(^{58}Ni,X) with E=276 MeV beam from the UNILAC at GSI. Measured Eα.

Others: 1996Pa01, 1988To13, 1988KaZK, 1987Bl14.

^{149}Dy Levels

E(level)	J^π	$T_{1/2}$	Comments
0.0	7/2$^-$	4.2 min *2*	J^π,$T_{1/2}$: from the Adopted Levels.

α radiations

Eα	E(level)	Iα[‡]	HF[†]	Comments
4518[#]				Eα: The 4518-keV α group was reported by 1980Da09 and was assigned to ^{153}Er from their measured $T_{1/2}$=35.1 s *20*. This α group was not observed by 1979Ho10 nor by 1974To07, and appears unlikely to belong to the ^{153}Er α decay since it would populate a level in the daughter at 157 keV, and such a level does not exist in ^{149}Dy.
4674 *2*	0.0	100	1.25 *8*	Eα: Weighted average of 4674 *4* (1996Pa0), 4671 keV *3* (1982Bo04), 4676 keV *2* (1982De11), 4674 keV *10* (1979Ho10,1981HoZM), 4671 *3* (1978AfZZ), 4675 keV *10* (1977Ha48), 4670 *10* (1970To16), and 4675 keV *20* (1963Ma18). Others: 4671 (1988To13), 4670 (1987Bl14), 4673 and 4676 (1980Da09).

[†] The nuclear radius parameter r_0(^{149}Dy)=1.558 *10* is deduced from interpolation (or unweighted average) of radius parameters of the adjacent even-even nuclides in 2020Si16.

[‡] For absolute intensity per 100 decays, multiply by 0.53 *3*.

[#] Existence of this branch is questionable.